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(54) DISPOSABLE FORMWORK FOR COLUMNS HAVING A CIRCULAR SECTION

(57) The invention relates to a perfectly cylindrical column that is structured by means of a rigid plastic flat sheet, e.g. high impact polyethylene or the like, the length of which coincides with the envisaged height of the column and the width of which coincides with the size of the section of said column. Said flat sheet is wound on a mounting core with the purpose of adopting a tubular and cylindrical configuration by connecting its longitudinal edges, said connection being temporarily stabilized with the aid of an adhesive tape extending throughout the entire connecting line. Said assembly is then provided with an outer rigidizing envelope in the form of a strip that is helicoidally wound on the tubular body, said strip consisting of a fiberglass mesh or mesh of fiberglass fibers longitudinally embedded in a paper support or the like. Said envelope will bear the radial strains generated by the casting of the concrete into the tubular body.

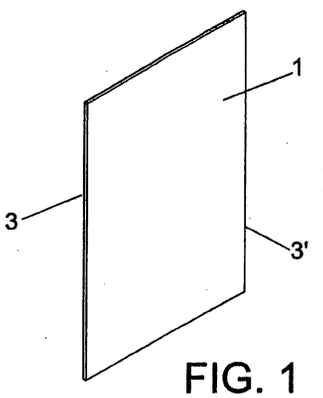

FIG. 1

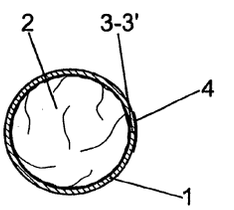

FIG. 2

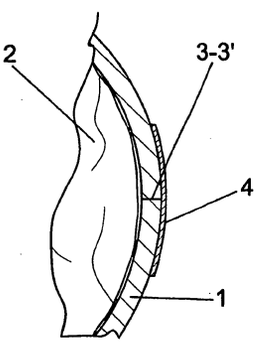

FIG. 3

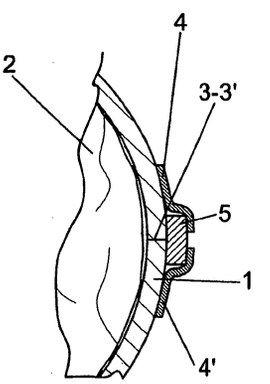

FIG. 4

EP 1 553 245 A1

Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a disposable formwork, especially conceived to produce cylindrical columns, for example using reinforced concrete.

[0002] The object of the invention is to achieve a formwork that allows perfectly cylindrical columns to be achieved.

BACKGROUND TO THE INVENTION

[0003] To build a column on the basis of, for example, reinforced concrete, it is necessary to have a mould or formwork that gives the final configuration and size thereto, and said formwork must integrate two different but complementary characteristics: on the one hand to ensure the column's perfect surface finish and, on the other hand, to do so at a sufficiently low cost so as to make it viable for the builder, especially when comprising disposable formwork.

[0004] Formwork offering the characteristics described above is disclosed in the Spanish invention patent with application number 9800419, of which the applicant is titleholder, which discloses disposable formwork for columns structured as a tubular body or core made on the basis of four pieces of expanded polystyrene, fitted together by means of adhesive strip throughout their connecting edges, a tubular core that is internally covered with a plastic sheet constituting an impermeable barrier, which is attached to said core by means of a layer of adhesive, whereas externally said tubular core is reinforced with a grid-like support structure, consisting of fibreglass mesh helicoidally wrapped around the tubular core and also attached thereto by means of adhesive, in such a way that said mesh confers the appropriate mechanical stability to the ensemble against the radial pressure generated by the mass of concrete to be poured inside the formwork.

[0005] An improvement of this formwork is contained in the certificate of addition to the abovementioned patent, with application number 9802487, which contemplates replacing the plastic sheet that forms the impermeable barrier attached to the core, by a series of wooden panels that are plastic-coated on their internal surface, or of rigid plastic plates, that join together with the help of adhesive strips conveniently mounted on their internal surface corresponding to the adjacent edges between plates, thus producing an internal tubular body with a perfectly smooth , waterproof surface, whereon, subsequently and externally , the polystyrene pieces constituting the central rigid tubular body are arranged and whereon, in turn and finally, the external support layer is established on the basis of the abovementioned helicoidally wound fibreglass mesh, providing the formwork with the appropriate mechanical resistance.

[0006] These two types of formwork are designed to produce square or rectangular section columns, but obviously on many occasions cylindrical columns must be produced, in other words, columns with a circular section. To this effect, patent invention with application number 200000010, of the same applicant, envisages increasing considerably the number of rigid plates that conform the formwork, specifically by turning them into very narrow strips, which given their large number and the joints between them, tend towards a circumferential section, but only in tendency, given that in reality the column produced is of a polygonal section, although with a considerable number of sides, corresponding to the number of plates or strips employed.

[0007] In an attempt to simplify the construction process of this formwork tending to wards a cylindrical shape, invention patent 200001776 envisages that the rigid bands fixed using adhesive strips of the above patent are replaced by a single board, also with a plastic-coated internal surface, which is subjected to a number of longitudinal cuts on its external surface to permit the required deformation thereof, so that, in turn, it may be transformed from its original, flat configuration into a cylindrical configuration. However, these cuts or slots in its external surface make the board deform in an irregular manner, obviously most accentuated on the lines corresponding to said cuts which, in practice , entails that the final result is not a perfect cylinder either, but rather that its section is also polygonal.

[0008] Finally, the following are also worthy of note: invention patent No. 9902893 "Machine for applying fibreglass reinforcement to disposable formwork for columns", which is complemented by Invention Patent application "Formwork for prismatic or cylindrical columns" with application number 200002631, also of the applicant, which envisages that the surrounding fibreglass mesh that gives the formwork the necessary mechanical resistance be replaced by a strip of a self-adhesive nature, consisting of paper or similar, wherein the fibreglass threads would be embedded and which exclusively adopt a longitudinal arrangement (instead of forming a mesh) which, after wrapping said strip on the formwork, makes the fibreglass threads adopt an appreciably transversal arrangement with respect to the formwork's axis, thus eliminating longitudinal threads that, due to their own situation, are inoperative according to the pursued object.

DESCRIPTION OF THE INVENTION

[0009] The disposable formwork proposed by the invention, starting from the basic premise of the abovementioned patents, i.e. establishing a tubular body reinforced externally through fibreglass threads, either in the shape of a mesh or embedded in a paper or similar support allowing the production of a perfectly cylindrical column, meaning a perfectly circular section, with an absence of any type of edge or roughness in its surface.

[0010] For this purpose, and in a more specific man-

ner, the formwork is structured using a smooth rigid plastic plate, such as, for example, made of high impact polystyrene (HDPE) or other similar material, a plate that adopts a perfectly cylindrical configuration when wrapped around an inflatable assembly core, obviously of a cylindrical configuration and with an external diameter equal to the diameter of the concrete column to be produced, joining the two complementary edges of said smooth plastic plate using self-adhesive tape.

[0011] Optionally, and to avoid problems of deformities on this joint line, as a result of the weakness thereof, it has been contemplated to place , on the external face of the tubular body corresponding to said connection line, a strip of the same material, of about 4 or 5 cm wide and the same length as the formwork and also fixed using one or two self-adhesive tapes.

[0012] The thus produced tubular body is complemented with the external surround structure based on fibreglass threads, whether in the shape of a mesh or independent threads embedded in a paper support or similar.

[0013] The elasticity of the rigid plastic used allows its transformation into a cylinder without the need for making cuts in its external surface or any other type of manipulations and said smooth plate, precisely because of its continuous thickness, ensures a perfectly cylindrical internal surface for the formwork which, in turn, determines a perfectly cylindrical section, i.e. not polygonal, for the column to be produced.

[0014] Obviously, the inflatable nature of the assembly core that has been referred to above has the purpose of facilitating the latter's disassembly once the formwork has been produced by deflating said core.

DESCRIPTION OF THE DRAWINGS

[0015] To complement the description that is being made and with the aim of contributing to a better understanding of the invention's specifications, following a preferred practical embodiment thereof, a set of drawings is included as an integral part of said description, which, by way of illustration but not delimitation, show the following:

Figure 1.- Shows the flat and smooth surface rigid plastic plate, which is used to produce the disposable formwork that is the object of this invention

Figure 2.- Shows the same flat plate of the figure above, duly fitted to the assembly core, according to a cross- section close-up.

Figure 3.- Shows an enlarged detail of the above figure corresponding to the area where said smooth plate closes in on itself, in the specific event of said closure being realised simply with the help of an adhesive tape.

Figure 4. Shows a detail similar to that of the above figure, but a reinforcing strip of the new material forming the smooth plate is used in the joint, in addition to said adhesive tape.

PREFERRED EMBODIMENT OF THE INVENTION

[0016] In view of the described figures and especially figure 1, we can see that in order to produce the disposable formwork proposed by the invention a smooth plate (1) of rigid plastic is used, such as, for example, rectangular, high impact polyethylene, , with a length equal to the envisaged height of the column to be produced, with a width in turn coinciding with the evolution of the section of said column, in other words with said section's circumference.

[0017] This plastic plate (1) is arched or wrapped around an assembly core (2), cylindrical, formally and dimensionally coinciding with the column to be produced, in such a way that the plate (1) comes back into contact with itself along its longitudinal or vertical edges (3-3') adopting a tubular and perfectly cylindrical shape, which is stabilised , in principle , with the help of adhesive tape (4) as shown in the enlarged detail of figure 3.

[0018] Nonetheless, it has been envisaged that in order to avoid the tubular body configured by said plate (1) becoming weakened at the level of the joint (3-3'), a reinforcing strip (5) may be applied externally, of the same rigid plastic as the plate (1) and length coinciding with length thereof, that is fixed to it with the help of a pair of adhesive tapes (4-4') or a much wider single adhesive tape, as shown in the detail of figure 4, a strip (5) that may have a varying width but , for the pursued object, can have a size between 4 and 5 cm.

[0019] In any event, the tubular body thus produced is externally reinforced with the classic helicoidal casing on the basis of a fibreglass mesh or a series of fibreglass threads embedded longitudinally and equidistantly on a paper support or similar, to provide the tubular body, and especially the joint (3-3') thereof, with the appropriate stability and mechanical resistance against radial pressure exerted by the concrete when poured inside the formwork, obviously after first removing the core (2) used during its assembly, and whose inflatable nature allows for an incredibly fast and simple disassembly.

Claims

1. Disposable formwork for circular section columns of the type incorporating a tubular body constituting the surface of the formwork, stabilised by an external casing consisting of a helicoidal band, either materialised in fibreglass mesh or in a series of fibreglass threads arranged longitudinally and equidistantly in a support of paper or similar, **characterised in that** said tubular body consists of a smooth plate (1) of rigid plastic, such as, for example , rectangular high impact polyethylene or similar, with a

length that coincides with the envisaged height of the column and a width in turn corresponding to the development of the circular section of said column, a plate that is arched and closes in on itself along its longitudinal or vertical edges (3-3') with the help of an adhesive external tape (4) that joins said edges, configuring a tubular and cylindrical body, which is stabilised by means of the external fibreglass.

2. Disposable formwork for circular section columns, according to claim 1, **characterised in that** optionally on the closing line (3-3') of the smooth plate on itself, there is an external strip (5) of the same rigid plastic, of about 4 or 5 cm wide, of a length coinciding with the length of the formwork, which reinforces said closing line and is fixed to the smooth plate also with the help of one or two adhesive tapes (4-4').

3. Disposable formwork for circular section columns, according to previous claims, **characterised in that** the smooth and initially flat plate (1) is transformed into a cylindrical element with the help of an assembly core (2), cylindrical, formally and dimensionally coinciding with the column to be produced and inflatable in order to facilitate its subsequent disassembly.

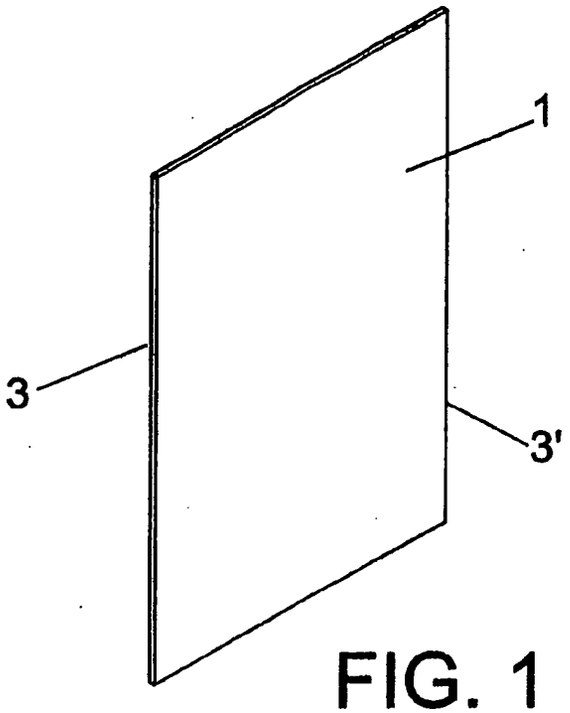

FIG. 1

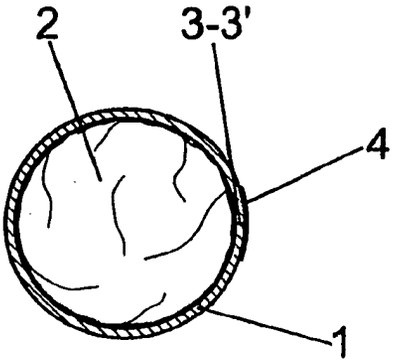

FIG. 2

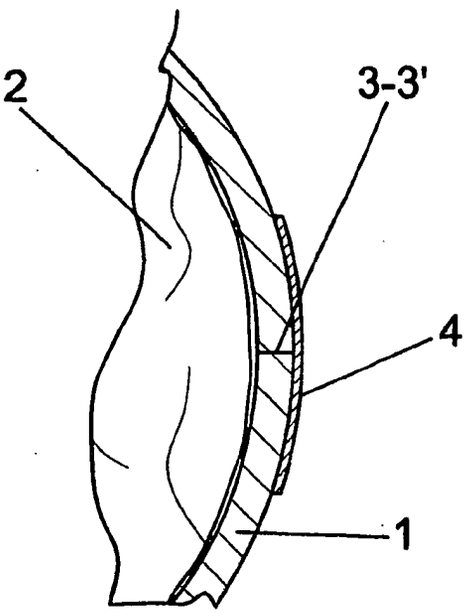

FIG. 3

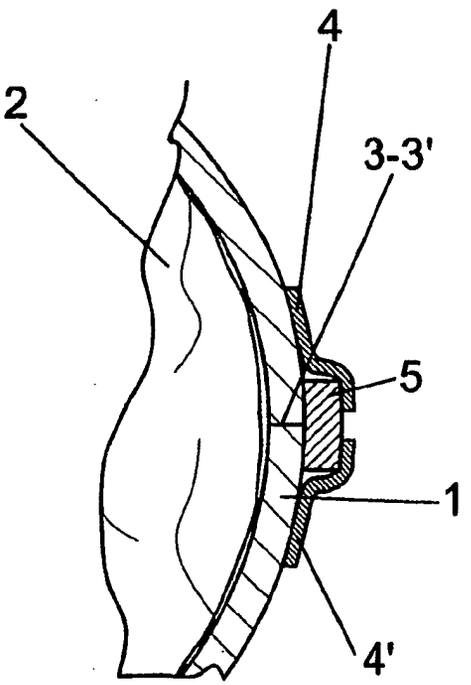

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 03/00275

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E04G 13/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E04G 13/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPIL, PAJ, CIBEPAT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 4595168 A (GOODWIN) 17.06.1986. **Column 3, line 30-column, 4, ligne 67; figures.**	1 2,3
Y	DE 4239454 A (CONSTRUMAT AG) 17.06.1993. **Description and figures.**	2
Y	FR 2775924 A (INTEISS) 17.09.1999. **Abstrat and figure 1.**	3
A	US 3942753 A (SACHS) 09.03.1976. **Abstrat and figures.**	1,2,3
Y	ES 285757 U (ROCHETTE CARTON TRANSFORME S.A.) 01.11.1985. **the whole document.**	1
Y	US 3357457 A (HUGHES AIRCRAFT CO) 12.12.1967. **the whole document.**	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 August 2003 (29.08.2003)	**19 sep 2003 (19.09.03)**
Name and mailing address of the ISA/ **S.P.T.O.** Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/ ES 03/00275

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